US ERA ARCHIVE DOCUMENT

From: Blackburn, Terrie A.

To: Wilson, Aimee

Cc: jgraves@waid.com; Blackburn, Terrie A.

Subject: RE: (External) ONEOK Cooling Tower BACT

Date: Monday, April 29, 2013 11:40:23 AM

Attachments: 04-29-13 Final - U.S. EPA Air Permits Section 6PD-R - Aimee Wilson.pdf

Aimee,

Attached is an Amendment to our application which includes a revised BACT analysis for the cooling tower evaluating the options listed below. The Amendment also includes revisions that are a result of refining the application based on the latest design data for the heaters.

When do you anticipate forwarding the draft permit and statement of basis for our review?

Terrie Blackburn

ESH Regulatory Compliance | ONEOK Partners, NGL | (918) 561-8052 office | (918) 237-5239 cell

From: Wilson, Aimee [mailto:Wilson.Aimee@epa.gov]

Sent: Thursday, April 25, 2013 9:02 AM

To: Blackburn, Terrie A. **Cc:** jgraves@waid.com

Subject: (External) ONEOK Cooling Tower BACT

Terrie,

HQ has finished their review of the draft permit and statement of basis. There is one last item that they need us to address before we can send the draft permit and SOB to you for review – the cooling tower BACT. I know we discussed this over the phone previously, but I need something in writing.

Please provide a revised BACT analysis that evaluates the following control options...

- Low cycles of concentration
- Acid and blowdown control
- Pretreatment of make-up water
- Once through seawater cooling
- Air cooling

Please provide a basis for eliminating these options, as necessary, based on technical or economical infeasibility.

Feel free to call me if you have any questions.

Thanks,

Aimee

This Email message contained an attachment named image001.jpg

which may be a computer program. This attached computer program could contain a computer virus which could cause harm to EPA's computers, network, and data. The attachment has been deleted.

This was done to limit the distribution of computer viruses introduced into the EPA network. EPA is deleting all computer program attachments sent from the Internet into the agency via Email.

If the message sender is known and the attachment was legitimate, you should contact the sender and request that they rename the file name extension and resend the Email with the renamed attachment. After receiving the revised Email, containing the renamed attachment, you can rename the file extension to its correct name.

For further information, please contact the EPA Call Center at (866) 411-4EPA (4372). The TDD number is (866) 489-4900.

******************* ATTACHMENT NOT DELIVERED ****************



4/29/2013

Ms. Aimee Wilson Air Permits Section (6PD-R) U.S. Environmental Protection Agency 1445 Ross Avenue Dallas, Texas 75202

Re: Revised Application Pages

Greenhouse Gas Prevention of Significant Deterioration Permit

ONEOK Hydrocarbon, L.P.

Mont Belvieu NGL Fractionation Plant

Dear Ms. Wilson:

On behalf of ONEOK Hydrocarbon, L.P., I am submitting revised application pages for the above-referenced permit application. These revisions are a result of refining the application based on the latest design data, and in responding to specific questions regarding cooling tower BACT from EPA staff. An updated air dispersion modeling analysis will be submitted under separate cover.

ONEOK is committed to working closely with EPA staff to facilitate the timely review of this application and issuance of a permit. To that end, if you have any questions or need any additional information during the course of your review please do not hesitate to contact Ms. Terrie Blackburn at (918) 561-8052 or by email at Terrie.Blackburn@oneok.com.

Respectfully,

Scott Schingen

Vice President - NGL Fractionation and Storage

Attachment

cc: Ms. Melanie Magee, EPA Region 6, Dallas, w/enclosure

Ms. Aimee Wilson April 2013

ATTACHMENT

REVISED APPLICATION PAGES

As stated in the cover letter, ONEOK Hydrocarbon, L.P. has re-evaluated and refined the permitting bases. As a result, the represented hot oil heater firing rates are increasing based on the latest data sheet provided by the burner vendor. The hot oil heater allowable emissions are also grouped on the summary tables. All application pages affected by these changes are included in this attachment.

Environmental Protection Agency – Region 6 Greenhouse Gas PSD Permit Application

ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Plant

Mont Belvieu, Chambers County TCEQ Regulated Entity No. RN106123714 TCEQ Customer No. CN603674086

> September 2012 Revised: April 2013

Prepared and Approved by:

Jason M. Graves, P.E. Principal Engineer ASON M GRAVES

ASON M GRAVES

BORNES

ASON M GRAVES

Waid Corporation dba Waid Environmental Certificate of Registration No. F-58





Texas Commission on Environmental Quality Form PI-1 General Application for Air Preconstruction Permit and Amendment

III.	Type of Permit Acti	ion Requested (continued)	
H.	Federal Operating P	Permit Requirements (30 TAC Chapter 122 Applicability) (continued)	
2.	Identify the type(s) o apply)	f FOP(s) issued and/or FOP application(s) submitted/pending for the site.	(check all that
GOI	Issued [GOP application/revision application submitted or under APD re	eview 🗌
SOF	Issued	SOP application/revision application submitted or under APD re	view 🔲
IV.	Public Notice Appli	cability	
A.	Is this a new permit a	application or a change of location application?	X YES □ NO
B.	Is this application for	r a concrete batch plant? If Yes, complete V.C.1 – V.C.2.	☐ YES 🗷 NO
C.	Is this an application or exceedance of a Pa	for a major modification of a PSD, nonattainment, FCAA 112(g) permit, AL permit?	X YES □ NO
D.	Is this application for less of an affected sta	a PSD or major modification of a PSD located within 100 kilometers or ate or Class I Area?	☐ YES 🗷 NO
If Ye	es, list the affected state	te(s) and/or Class I Area(s).	
E.	Is this a state permit a	amendment application? If Yes, complete IV.E.1. – IV.E.3.	
1.	Is there any change in	n character of emissions in this application?	☐ YES ☐ NO
2.	Is there a new air con	ntaminant in this application?	☐ YES ☐ NO
3.	Do the facilities hand vegetables fibers (agr	lle, load, unload, dry, manufacture, or process grain, seed, legumes, or ricultural facilities)?	☐ YES ☐ NO
F.	List the total annual e sheets as needed):	emission increases associated with the application (list all that apply and a	ittach additional
Vola	tile Organic Compour	nds (VOC):	
Sulf	ur Dioxide (SO ₂);		
Carb	on Monoxide (CO):		
Nitre	ogen Oxides (NO _x):		
Parti	culate Matter (PM):		
PM	microns or less (PM	110):	
PM :	25 microns or less (PM	M _{2.5}):	
Lead	l (Pb):		
Haza	ardous Air Pollutants ((HAPs):	
Othe	r speciated air contam	ninants not listed above: CO2e = 233,000 TPY	

Texas Federal Implementation Plan (FIP), the site is a major source of GHG emissions, and the proposed changes constitute a major modification for GHG emissions. Therefore, this separate application for a PSD permit is being submitted to EPA for this Project pursuant to the Texas greenhouse gas permitting FIP to authorize greenhouse gas emissions associated with the Project.

During their review of the GHG permit application, EPA requested that emissions of criteria pollutants that exceed the PSD significance level be evaluated as triggering PSD review. As a result of this request, ONOK has re-evaluated and refined our permitting emissions basis. The revised emission calculations which have been submitted to TCEQ demonstrate that project emissions of each criteria pollutant are below the applicable PSD significance threshold for evaluation as a major modification. The project remains subject to PSD review for GHG emissions.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	September 2012, Revised April 2013	Permit No.: TBD	Regulated Entity No.:	RN106123714
Area Name:	Mont Belvieu NGL Fractionation Plant		Customer Reference No.:	CN603674086

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table

		AIR C	ONTAMINANT DATA		
1. Emission Point				3. Air Contaminant I	Emission Rate
(A) EPN	(B) FIN	(C) Name	2. Component or Air Contaminant Name	(A) Pounds per Hour	(B) TPY
H-04	H-04	Hot Oil Heater 4	CO ₂ e		
H-05	H-05	Hot Oil Heater 5	CO₂e		215,314
H-06	H-06	Hot Oil Heater 6	CO ₂ e		
H-04/H-05/H- 06	VENTS	Frac-2 Process Vents to Heaters	CO ₂ e		15,000
FL-01	FL-01	Flare (Frac-2 Contribution)	CO ₂ e		1,301
CT-04	CT-04	Frac-2 Cooling Tower	CO ₂ e		Work Practice Standard
ENG-05	ENG-05	Frac-2 Emergency Generator	CO ₂ e		43
ENG-06	ENG-06	Frac-2 Firewater Pump	CO₂e		45
FUG-03	FUG-03	Frac-2 Equipment Leak Fugitives	CO₂e		Work Practice Standard
FL-01	MSS-FL-2	MSS-Flaring (Frac-2 Contribution)	CO ₂ e		Work Practice Standard
MSS-FUG-2	ATM-MSS-2	MSS-Degassing (Frac-2 Contribution)	CO₂e		Work Practice Standard

EPN = Emission Point Number FIN = Facility Identification Number

ONEOK Frac-2 Emissions Summary

FIN	EPN	Description	Previously Authorized	Proposed	Increase/(Decrease)	ENVIOLE .	
		100,000	(tons/yr)	(tons/yr)	(tons/yr)	Basis of Change	
Proposed New E	quipment/Emissions						
H-04	H-04	Hot Oil Heater 4	0			New Emissions Unit	
H-05	H-05	Hot Oil Heater 5	0	215,314	215,314	New Emissions Unit	
H-06	H-06	Hot Oil Heater 6	0	1 (1)		New Emissions Unit	
/ENTS	H-04/H-05/H-06	Frac-2 Process Vents to Heaters	0	15,000	15,000	New Emissions Unit	
FL-01	FL-01	Flare (Frac-2 Contribution)	0	1,301	1,301	Modified Emissions Unit	
CT-04	CT-04	Frac-2 Cooling Tower	0	0.34	0.34	New Emissions Unit	
ENG-05	ENG-05	Frac-2 Emergency Generator	0	8	8	New Emissions Unit	
ENG-06	ENG-06	Frac-2 Firewater Pump	0	35	35	New Emissions Unit	
FUG-03	FUG-03	Frac-2 Equipment Leak Fugitives	0	10,6	11	New Emissions Unit	
MSS-FL-2	FL-01	MSS-Flaring (Frac-2 Contribution)	0	978	978	Modified Emissions Unit	
ATM-MSS-2	MSS-FUG-2	MSS-Degassing (Frac-2 Contribution)	0	21	21	New Emissions Unit	
Total				233,000	233,000		

ONEOK HYDROCARBON, L.P. MONT BELVIEU NGL FRACTIONATION PLANT PERMIT APPLICATION - PLANT EXPANSION

SEPTEMBER 2012 REVISED: APRIL 2013

Hot Oil Heater 4

EPN: H-04 FIN: H-04

Annual Average Duty:

140

MM Btu/hr (HHV) MM Btu/hr (24-hr average, HHV)

Maximum Duty: Fuel Heating Value:

154

Hours of Operation:

8760 hr/yr

1000

Btu/scf

(HHV basis, natural gas average)

Fuel F-Factor: 8710

dscf/MM Btu (HHV) 40 CFR Part 60, Appendix A, Table 19-2 value for natural gas

Pollutant	Assumed	sumed Emission Factor			Emission Factor Emissions		slons	GWP	CO2e	
Politicant	MW	lb/MM scf	lb/MM Btu	ppmvd @ 3% O2	Source	lb/hr	(ton/yr)		lb/hr	(ton/yr)
CH4			0.00220		40 CFR 98 Subpart C, Table C-2	0.3	1.4	21.00	7	29
CO2			116.9		40 CFR 98 Subpart C, Table C-1	18,000	71,700	1.00	18,000	71,700
N20	144		0.00022		40 CFR 98 Subpart C, Table C-2	0.0	0.1	310.00	11	42
						_		Total CO2e	18.018	71.771

Notes

Ib/hr Emissions = Maximum Duty * Emission Factor
 ton/yr Emissions = Annual Average Duty * Annual Operating Hours* Emission Factor / 2000

ONEOK HYDROCARBON, L.P.
MONT BELVIEU NGL FRACTIONATION PLANT
PERMIT APPLICATION - PLANT EXPANSION

SEPTEMBER 2012 REVISED: APRIL 2013

Hot Oll Heater 5

EPN: H-05 FIN: H-05

Annual Average Duty: 140 MM Btu/hr (HHV)

Maximum Duty: 154 MM Btu/hr (24-hr average, HHV)

Hours of Operation: 8760 hr/yr

Fuel Heating Value: 1000 Btu/scf (HHV basis, natural gas average)

Fuel F-Factor: 8710 dscf/MM Btu (HHV) 40 CFR Part 60, Appendix A, Table 19-2 value for natural gas

Pollutant	Assumed		Emission Factor			Emissions		GWP	CO2e	
Ponutant	MW	Ib/MM scf	lb/MM Btu	ppmvd @ 3% O2	Source	lb/hr	(ton/yr)		lb/hr	(ton/yr)
CH4			0.00220		40 CFR 98 Subpart C, Table C-2	0.3	1.4	21.00	7	29
CO2	111		116.9		40 CFR 98 Subpart C, Table C-1	18,000	71,700	1.00	18,000	71.700
N20			0.00022		40 CFR 98 Subpart C. Table C-2	0.0	0.1	310.00	-11	42
								Total CO2e	18.018	71 771

Notes

1. Ib/hr Emissions = Maximum Duty * Emission Factor

2. ton/yr Emissions = Annual Average Duty * Annual Operating Hours* Emission Factor / 2000

ONEOK HYDROCARBON, L.P. MONT BELVIEU NGL FRACTIONATION PLANT PERMIT APPLICATION - PLANT EXPANSION

SEPTEMBER 2012 REVISED: APRIL 2013

Hot Oil Heater 6

EPN: H-06 FIN: H-06

Annual Average Duty:

140 MM Btu/hr (HHV)

Maximum Duty: 154

MM Btu/hr (24-hr average, HHV)

Hours of Operation:

8760

Fuel Heating Value: 1000

Blu/scf

Fuel F-Factor: 8710

(HHV basis, natural gas average) dscf/MM Btu (HHV) 40 CFR Part 60, Appendix A, Table 19-2 value for natural gas

Pollutant	Assumed	sumed Emission Factor			Emissions		GWP	CO2e		
Politicant	MW	Ib/MM scf	Ib/MM Btu	ppmvd @ 3% O2	Source	lb/hr	(ton/yr)	LANCE OF	lb/hr	(ton/yr)
CH4			0.00220		40 CFR 98 Subpart C, Table C-2	0.3	1.4	21.00	7	29
CO2			116.9		40 CFR 98 Subpart C, Table C-1	18,000	71,700	1.00	18,000	71,700
N2O			0.00022		40 CFR 98 Subpart C, Table C-2	0.0	0.1	310.00	11	42
								T	10.515	24.224

Total CO2e 18,018 71,771

Notes

1. lb/hr Emissions = Maximum Duty * Emission Factor

2. ton/yr Emissions = Annual Average Duty * Annual Operating Hours* Emission Factor / 2000

Based on the cost analysis, ONEOK has determined that the added capital and operating cost of implementing CCS for the new heaters would make the proposed Project as a whole economically infeasible. The estimated capital cost for the new unit is about \$400 million. Annualized, this equates to about \$40 million, so the cost of CCS would increase the cost of the project (or reduce the rate of return) by about 40%.

In addition to being unavailable, technically infeasible, and not cost-effective, the implementation of CCS also results in significant adverse collateral energy and environmental impacts. The increased energy consumption for the CCS system would completely negate any efficiency savings from implementing efficient design and operational practices for the heaters themselves. The additional regeneration heater demand would result in additional increases for all other criteria pollutant emissions and creates another GHG source which would have to be captured.

Step 5: Select the BACT.

In the fifth step, the most effective control option, based on the impacts quantified in Step 4, is proposed as BACT for the pollutant and emission unit under review. For the hot oil heaters, ONEOK proposes use of the top and only remaining options as BACT, which are to implement energy efficient design and operating practices and burn low-carbon fuel (by using natural gas, recovered flare gas, and process vent gases). The proposed form of the emission limitations is summarized in the following table:

Category	Demonstration
Limitations	Greenhouse gas emissions from the group of hot oil heaters will be limited to 215,314 tons CO₂e per year on a 365-day rolling average. The hot oil heaters will maintain a minimum efficiency by maintaining a maximum stack exit temperature of 385 degrees F on a 365-day rolling average basis, excluding periods of start-up and shutdown.
	In accordance with 40 C.F.R. Part 63, Subpart DDDDD, the permittee will conduct annual tune-up (burner inspection and cleaning, flame inspection and optimization, air-to-fuel ratio, and CO optimization).
Monitoring Requirements	The permittee shall maintain compliance with 40 C.F.R. Part 98, Subpart C including flow monitoring of fuel usage and fuel gas analysis. The permittee shall maintain a flue gas temperature monitor to continuously record flue gas exit temperature on each hot oil heater while the heaters are in service.
Compliance Demonstration	The permittee shall calculate compliance with the 365-day rolling average limitations following the procedures specified in 40 C.F.R. Part 98, Subpart C, with a conversion from metric tons to short tons.

BACT for Cooling Towers

GHG emissions from cooling towers are the result of potential leaks from heat exchangers into cooling water which would be stripped and emitted from the cooling towers associated with the proposed Project. Methane is present in variable concentrations in process streams, with highest concentrations in natural gas. Because methane is a GHG, the analysis focuses on mitigating methane emissions from leaks into cooling water.

Step 1: Identify all available control technologies.

In reviewing the resources outlined above, the following technologies were identified as potentially available for the cooling towers in this application:

Technology	Description	Availability
Cooling Tower Monitoring and Repair	This technology consists of monthly monitoring of the cooling water to detect leaks, and subsequent repair of any exchangers that that have been determined to be leaking.	Available

As shown in the table above, the only technology identified is considered available, and will be evaluated in Step 2.

In addition to the technologies identified by ONEOK, EPA specifically requested that the following technologies be evaluated for availability and technical feasibility for controlling GHG emissions in this application. Note that although these technologies are listed in the RACT/BACT/LAER Clearinghouse, they have been listed there because they are potential control strategies for particulate emissions, not for VOC or GHG emissions. Details are outlined below.

Technology	Description	Availability for GHG Control
Low cycles of concentration	By using a higher rate of makeup water, the concentration of total dissolved solids in the recirculating water stream can be reduced. This reduces particulate matter in the cooling water drift.	Not available – This technology has no impact on GHG emissions. This would also increase wastewater discharge.
Acid and blowdown control	By carefully controlling the acid addition and cooling tower water blowdown rate, the concentration of total dissolved solids in the recirculating water stream can be reduced. This reduces particulate matter in the cooling water drift.	Not available – This technology has no impact on GHG emissions.
Pretreatment of make-up water	By pre-treating make-up water, the concentration of total dissolved solids in the recirculating water stream can be reduced. This reduces particulate matter in the cooling water drift.	Not available – This technology has no impact on GHG emissions.

Technology	Description	Availability for GHG Control
Once through seawater cooling	By using seawater as a cooling medium, the recirculating cooling tower could be eliminated. However, any GHG leaks from heat exchangers would still leak into the seawater cooling medium, and would be emitted to the air at the same rate.	Not available – This technology has no impact on GHG emissions, and the site is not adjacent to the ocean.
Air cooling	By using air as a cooling medium, the recirculating cooling tower could be eliminated. However, any GHG leaks from heat exchangers would still leak into the air, and would be emitted at the same rate from equipment leak fugitives. In addition, using air cooling in this region would force distillation processes to be operated at higher temperatures and pressures. As a result, using air cooling would increase the required firing rate of the hot oil heaters and would increase overall GHG emissions.	Not available – This technology would increase GHG emissions. Emissions would be quantified as increased equipment leak fugitives and heater GHG emissions.

Since none of these additional technologies are available for use in reducing GHG emissions, they have not been considered in Steps 2-5 of the BACT analysis.

Step 2: Eliminate technically infeasible options.

The second step requires the evaluation of the technical feasibility of each control option identified in Step 1 with respect to source-specific factors. Technologies that are determined to be infeasible are eliminated from further consideration. Based on the options carried forward from Step 1, the following table summarizes technical feasibility.

Technology	Description	Feasibility
Cooling Tower Monitoring and Repair	This technology consists of monthly monitoring of the cooling water to detect leaks, and subsequent repair of any exchangers that that have been determined to be leaking.	Technically Feasible

As shown in the table above, the only technology identified is considered feasible, and will be evaluated in Step 3.

Step 3: Rank remaining control technologies.

As part of the third step, all remaining control technologies not eliminated in Step 2 are ranked and then listed in order of overall control effectiveness for the pollutant under review, with the most effective control alternative at the top. In this case, implementation of cooling tower monitoring and repair is ranked at the top of the list as the only available and technically feasible control option available. Quantifying the reduction potential is not necessary.

ATTACHMENT IX.A

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The New Source Performance Standards (NSPS) in 40 CFR Part 60, Subpart Db (steam generating units), Subpart IIII (stationary compression ignition engines), and Subpart OOOO (crude oil and natural gas production, transmission and distribution) are applicable to this facility. ONEOK will comply with the control, monitoring, reporting, and recording requirements of all applicable NSPS.



TABLE 1F AIR QUALITY APPLICATION SUPPLEMENT

Permit No.: To Be Assigned	Application Submittal Date: September 18, 2012	
Company: ONEOK Hydrocarbon, L.P.		
RN: RN106123714	Facility Location: 11350 Fitzgerald	
City: Baytown	County: Chambers	
Permit Unit I.D.: Mont Belvieu NGL Fractionation Plant	Permit Name: Mont Belvieu NGL Fractionation Plant	
Permit Activity: New Source Modification		
Project or Process Description: Mont Belvieu NGL Fraction	onation Plant Expansion	

Complete for all Pollutants with a Project Emission Increase.		POLLUTANTS							
		Ozone		PM ₁₀	NOx	SO ₂	Other¹	Other1	
	voc	NOx					CO2e		
Nonattainment? (yes or no)							NO		
Existing site PTE (tpy)?							221,000		
Proposed project emission increases (tpy from 2F) ³				1)/5			233,000		
Is the existing site a major source? ² If not, is the project a major source by itself? (yes or no)							YES		
If site is major, is project increase significant?							YES	1	
If netting required, estimated start of construction?	April 2	013					•		
Five years prior to start of construction	April 2008				contemporaneous				
Estimated start of operation	~October 2014			period					
Net contemporaneous change, including proposed project, from Table 3F. (tpy)							454,000		
FNSR APPLICABLE? (yes or no)	i in						YES	li .	

Other PSD pollutants.

Nonattainment major source is defined in Table 1 in 30 TAC 116.12(11) by pollutant and county. PSD thresholds are found in 40 CFR § 51.166(b)(1).

Sum of proposed emissions minus baseline emissions, increases only. Nonattainment thresholds are found in Table 1 in 30 TAC 116.12(11) and PSD thresholds in 40 CFR § 51.166(b)(23).

The representations made above and on the accompanying tables are true and correct to the best of my knowledge.

Signature VP-NGL FRACTIONATION + STORAGE 4/29/2013
Date



TABLE 2F PROJECT EMISSION INCREASE

Pollutant ⁽¹⁾ :	CO2e	Permit: To Be Assigned					
Baseline Period:	NA	to NA					

	Affected or Modified Facilities ⁽²⁾ FIN EPN		Permit No.	Actual Emissions ⁽³⁾	Basline Emissions ⁽⁴⁾	Proposed Emissions (5)	Projected Actual Emissions	Difference (B-A) (6)	Correction(*)	Project Increase (8)
1	H-04	H-04		0	0	71,771		71,771		71,771
2	H-05	H-05		0	0	71,771		71,771		71,771
3	H-06	H-06		0	0	71,771		71,771		71,771
4	VENTS	H-04/H-05/H-06		0	0	15,000		15,000		15,000
5	FL-01	FL-01		0	0	1,301		1,301		1,301
6	CT-04	CT-04		0	0	0.34		0.34		0.34
7	ENG-05	ENG-05		0	0	8		8		8
8	ENG-06	ENG-06		0	0	35		35		35
9	FUG-03	FUG-03		0	0	11		11		11
10	MSS-FL-2	FL-01		0	0	978		978		978
11	ATM-MSS-2	MSS-FUG-2		0	0	21		21		21
12										
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